Manufacturing LPS Bulletin – Reliability
NHT Reactor Shutdown Due To High Pressure Differential

IMPACT ERM LOSS ID:
12223

Contact Information:
Gerald Lee
510-242-2594
GEWL@chevron.com

Tenets of Operations Breached:

1. **Always involve the right people in decisions that affect procedures and equipment.**

URIP
Design/Care/Fix/Prevent

Incident Description:
The NHT reactor experienced rapid pressure drop increases starting in early December after d/p climbed from 30 psi to 65 psi within a matter of weeks. Chemical injection was used to reduce the rate of d/p increase, but was unsuccessful in completely mitigating the fouling impacts on unit throughput. Reduced NHT rates affected refinery operations in January as limited reformer rates reduced Hydrogen availability during the H2B train shutdown. The NHT was shut down on February 18th to address the reactor fouling, and this event was classified as a reliability clock reset.

Investigation Findings:

1. There was no plan for skimming the NHT reactor catalyst between turnarounds despite the pressure drop increases being a known issue.
2. Iron sulfide in process from reactor feed system piping.
3. The NHT plant feed tank is the only tank available for off-test product during FCC/GHT shutdowns.
4. Step change in recycle hydrogen specific gravity in December 2010 caused a temporary increase in makeup gas rate, disrupting R-410 catalyst.

Things That Worked Well:

1. Nalco chemical injection extended the plant run and allowed the NHT to produce feed for the Rheniformers while the refinery was experiencing limited availability of hydrogen due to the H2B turnaround.
2. This was the longest NHT operational run in its history.
3. NHT plant turnaround duration was minimized. It was completed in 5 days.

Recommendations:

1. Add NHT reactor skim procedure to the refinery long range plan and indicate that it should be done approximately 3 years after the plant major S/D.
2. Determine whether there should be a preventative maintenance procedure developed to change out the reactor feed coalescer pad on an annual basis or when d/p approaches 15 psi.
3. Review the economics of making additional feed tanks available for FCC/GHT feed material vs. planning for a pit-stop & catalyst skim and make a recommendation to the appropriate Refinery personnel based upon the findings.